

CLAIMS

What is claimed is:

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1           1.     A method for adjusting the speed of operation of a channel for  
2 communicating with disk drives in a multi ported system organized into a plurality of  
3 enclosure services modules and having a first channel connected in sequence from a  
4 bridge controller to a first enclosure services module and successively connected to  
5 successive enclosure services modules to a last enclosure services module and a second  
6 channel connected in reverse sequence from the bridge controller to the last enclosure  
7 services module and successively connected to the successive enclosure services modules  
8 to the first enclosure services module, the steps comprising: changing the speed of either  
9 the first or second channel and using the other of the first and second channel to send a  
10 change speed frame from the bridge controller to each of the plurality of enclosure  
11 services modules.

12           2.     The method of Claim 1, further comprising initially sending the change  
13 speed frame from the bridge controller to either the first enclosure services module or the  
14 last enclosure services module.

15           3.     The method of Claim 2, further comprising, upon the enclosure service  
16 module's receipt of the change speed frame, waiting for that enclosure to come up on the  
17 channel for which the speed is to be changed.

18           4.     The method of Claim 3, wherein the enclosure service modules, after  
19 coming up on the channel for which the speed is to be changed, pass the change speed  
20 frame on to the successive enclosure services module until all the plurality of enclosure  
21 services modules have had their speeds changed on the channel for which the speed is to  
22 be changed.

23           5.     The method of Claim 4, wherein there is a third channel.

24           6.     The method of Claim 4, wherein the disk drives are fibre channel disk  
25 drives.

26           7.     The method of Claim 4, wherein change speed frame is in a frame format.

- 1           8.       The method of Claim 4, wherein the disk drives recognize, on the fly, that
- 2       the speed has been changed.
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2           9.     A system for adjusting the speed of operation of a channel for  
3 communicating with disk drives in a multi ported system, comprising:

4                 a bridge controller having a first channel and a second channel; and

5                 a plurality of enclosure services modules, each having a first channel connected in  
6 sequence from a bridge controller to a first enclosure services module and successively  
7 connected to successive enclosure services modules to a last enclosure services module  
8 and each having a second channel connected in reverse sequence from the bridge  
9 controller to the last enclosure services module and successively connected to the  
10 successive enclosure services modules to the first enclosure services module.

11           10.    The system of Claim 9, wherein one of the first and second channels is  
12 used to send a speed change frame to set the speed of the other of the first and second  
13 channel.

14           11.    The system of Claim 10, wherein the each of the first and second channel  
15 is bi-directional.

16           12.    The system of Claim 10, wherein the disk drives are fibre channel disk  
17 drives.

18           13.    The system of Claim 10, wherein the enclosure services modules each  
19 have bypass circuitry to bypass individual disk drives.

20           14.    The system of Claim 10, wherein the enclosure services modules each  
21 have a microprocessor.

22           15.    A system for adjusting the speed of operation of a channel for  
23 communicating with disk drives in a multi ported system, comprising:

24                 a bridge controller having a first channel and a second channel; and

25                 a plurality of enclosure services modules, each having a first channel connected in  
26 sequence from a bridge controller to a first enclosure services module and successively  
27 connected to successive enclosure services modules to a last enclosure services module  
28 and each having a second channel connected in reverse sequence from the bridge  
29 controller to the last enclosure services module and successively connected to the

- 1 successive enclosure services modules to the first enclosure services module, the system
- 2 operating according to the method of Claim 8.
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16. A system for passing a signal to a chain of electrically connected devices having two channels, comprising  
a controller device; and  
a plurality of subservient devices,  
wherein the controller device is connected both in an open chain manner to the subservient devices in a forward order and in a physically separate reverse order.

17. The system of Claim 16, wherein the forward connection and the reverse connection define the two channels.

18. The system of Claim 17, wherein a command signal is sent to one of the two channels to change a parameter of the other of the two channels.

19. The system of Claim 18, wherein the controller device is a bridge controller and the subservient devices are enclosure services modules for disk drives.

20. The system of Claim 19, wherein the command signal is a speed change frame in a frame format and the disk drives are fibre channel disk drives.

21. The system of Claim 20, wherein system employs a method for passing a command signal to a chain of electrically connected devices having at least two channels, comprising:

using one of the channels to pass the command signal to the chain of electrically connected devices; and

using the other of the channels to make changes to a parameter regarding the chain of electrically connected devices for that channel.

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2           22.    A method for passing a command signal to a chain of electrically  
3 connected devices having at least two channels, comprising:

4                using one of the channels to pass the command signal to the chain of electrically  
5 connected devices; and

6                using the other of the channels to make changes to a parameter regarding the  
7 chain of electrically connected devices for that channel.

8           23.    The method of Claim 22, wherein the electrically connected devices of the  
9 two channels are connected in reverse order relative to one another.

10          24.    The method of Claim 23, wherein the command signal is a speed change  
11 command in a frame format.

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